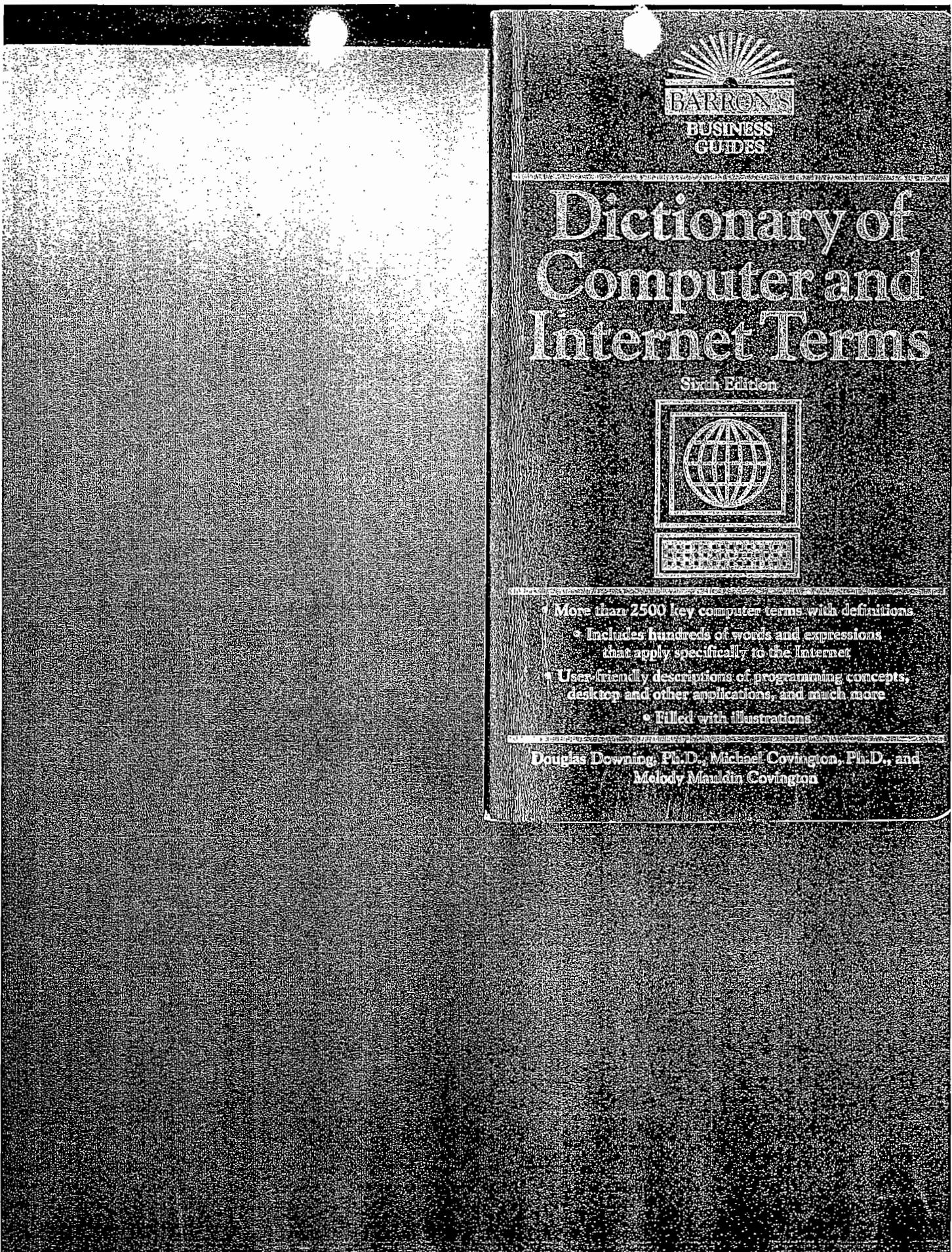


EXHIBIT K



Dictionary of Computer and Internet Terms

Sixth Edition

Douglas A. Downing, Ph.D.
School of Business and Economics
Seattle Pacific University

Michael A. Covington, Ph.D.
Artificial Intelligence Center
The University of Georgia

Melody Mauldin Covington
Covington Innovations
Athens, Georgia



© Copyright 1998 by Barron's Educational Series, Inc.
Prior editions © copyright 1996, 1995, 1992, 1989, and 1986
by Barron's Educational Series, Inc.

All rights reserved.
No part of this book may be reproduced in any form, by photostat, microfilm,
xerography, or any other means, or incorporated into any information
retrieval system, electronic or mechanical, without the written permission
of the copyright owner.

All inquiries should be addressed to:
Barron's Educational Series, Inc.
250 Wireless Boulevard
Hauppauge, New York 11788
<http://www.barronseduc.com>

Library of Congress Catalog Card No. 98-6984

International Standard Book No. 0-7641-0094-7

Library of Congress Cataloging-in-Publication Data

Downing, Douglas.
Dictionary of computer and Internet terms / Douglas A. Downing,
Michael A. Covington, Melody Mauldin Covington—6th ed.
p. cm.
First-4th eds. published under title: Dictionary of computer
terms.
ISBN 0-7641-0094-7
1. Computers—Dictionaries. 2. Internet (Computer network)—
Dictionaries. I. Covington, Michael A., 1957—. II. Covington,
Melody Mauldin. III. Downing, Douglas. Dictionary of computer
terms. IV. Title.
QA76.15.D667 1998
004'.03—dc21

98-6984
CIP

PRINTED IN THE UNITED STATES OF AMERICA

9876543

3. a set of numbers identifying a machine on the Internet; *see IP ADDRESS*.
4. an electronic mail address. *See ELECTRONIC MAIL; INTERNET.*
5. a URL identifying a web page. *See URL.*

ADM-3A a type of computer terminal marketed by Lear Siegler in the early 1980s. Like most terminals, the ADM-3A transmits and receives ASCII characters asynchronously through an RS-232 serial port. It is not VT-100 compatible (*see VT-100*), but it has its own simpler set of codes for controlling the screen, which have been adopted on some other terminals and computers.

Adobe Systems, Inc. (Palo Alto, California) the software company that pioneered the PostScript command language for output devices. Adobe is also a leader in producing high-quality fonts and graphics software, including Adobe Type Manager (ATM), Photoshop, Illustrator, and PageMaker (for both Macintosh and PC platforms). For digital video production Adobe markets Premiere and After Effects. Also of interest is Adobe Acrobat—a program which allows electronic distribution of formatted documents. (*See PDF.*)

For further information about Adobe and their products, you can reach their web site at <http://www.adobe.com>. *See also POSTSCRIPT; ATM; DESKTOP PUBLISHING; PORTABLE DIGITAL DOCUMENT; TYPE 1 FONTS.*

Adobe Type Manager *see ATM* (definition 1).

ADSL (Asymmetric Digital Subscriber Line) a type of high-speed digital telephone connection used mainly for systems that involve digital video. It supports data rates of 6 million bits per second in one direction and 576 kilobits per second in the other direction.

adventure game a computer game in which the user finds a path through a set of "rooms" that are described verbally or graphically, manipulating objects along the way (Fig. 6). The computer responds to simple commands in English. The first adventure game is said to have been invented by Will Crowther in the 1970s.

Adventure games provided the foundation for MUD and other sophisticated user interfaces. *See also VIRTUAL REALITY.*

adware software that is distributed free in order to advertise a product. *Compare SHAREWARE, FREE SOFTWARE.*

AF (audio frequency) a frequency within the range of human hearing, 20 to 20,000 hertz. *Contrast RF.*

AFAIK e-mail abbreviation for "as far as I know."

AFAIR e-mail abbreviation for "as far as I remember."

agent a piece of software that performs a service for someone, usu-

D

DAC *see* DIGITAL-TO-ANALOG CONVERTER.

D/A converter *see* DIGITAL-TO-ANALOG CONVERTER.

daemon (under UNIX) a program that runs continuously in the background, or is activated by a particular event. The word *daemon* is Greek for "spirit" or "soul."

dagger the character †, sometimes used to mark footnotes. *See also* FOOTNOTE. Also called an OBELISK or LONG CROSS.

daisy-chain to connect devices together in sequence with cables. For example, if four devices A, B, C, and D are daisy-chained, there will be a cable from A to B, a cable from B to C, and a cable from C to D.

daisywheel printer a printer that uses a rotating plastic wheel as a type element. Daisywheel printers were often used with microcomputers in the early 1980s. They printed high-quality text, but they were relatively slow and could not print graphics.

dash (—) a punctuation mark similar to a hyphen, but longer. On a typewriter, a dash is typed as two hyphens. (In WordPerfect, it should be typed as two required hyphens, so that a line break will not be placed between them; *see* REQUIRED HYPHEN.)

Proportional-pitch type often includes one or more kinds of dashes, such as an em dash (—), which is as wide as the height of the font, and an en dash (‐), which is two-thirds as wide as the em dash. Normally, the em dash joins sentences and the en dash joins numbers (as in "1995‐98").

data information. The word was originally the plural of *datum*, which means "a single fact," but is now used as a collective singular. Data processing is the act of using data for making calculations or decisions.

database a collection of data stored on a computer storage medium, such as a disk, that can be used for more than one purpose. For example, a firm that maintains a database containing information on its employees will be able to use the same data for payroll, personnel, and other purposes. *See* DATABASE MANAGEMENT.

database management the task of storing data in a database and retrieving information from that data. There are three aspects of database management: entering data, modifying or updating data, and presenting output reports. Many mainframe computers are used by businesses for database management purposes. Several software packages are available for database management on microcomputers.

lar because it minimizes the errors that can occur if the same information has to be typed into computers several times.

For example, consider a department ordering an item from a supplier. In a paper-based system, the department will typically fill out a requisition that needs to be approved by the purchasing department, which fills out a purchase order, which is sent to the supplier. The supplier will need to generate its own paperwork to direct the billing and shipment of the item. When the item is received, the receiving department will need to fill out more paperwork for verification. More paperwork will be required for the accounts payable department to receive authorization to pay the bill, and then a paper check must be sent. All that paperwork is required even if the process operates correctly; if an error is made or another inquiry is necessary, still more paperwork will be generated. At each stage of the process, a person can make mistakes typing the relevant information, such as the name of the supplier and the part number of the item being ordered.

In an electronic data interchange system, the basic flow of information is the same, except that electronic messages take the place of paper. These messages are similar to electronic mail, except that there is a standard format for each type of message so that software can read it and automatically generate the next message in the process. The part number, quantity, and supplier get typed only once, at the beginning, and then are automatically transferred from computer to computer. At the end, even the payment may take place by electronic funds transfer rather than by writing a check.

Electronic data interchange systems can work only if all of the companies involved have agreed on the same standards. Extra care must be taken to protect against fraud, and the legal system needs to adjust to the fact that in the absence of paper documents, it is not possible to use signatures as evidence of approval. Nevertheless, the advantages of electronic data interchange are such that this type of system will become more common in the future. *See also* ELECTRONIC MAIL.

electronic document a document intended to be read as it is displayed on a monitor. Since it is freed from the constraints of printing, an electronic document can make use of HYPERTEXT, screen special effects such as flashing, and full color. WEB PAGES are a type of electronic document; so are catalogs, documentation, and MULTIMEDIA presentations distributed on CD-ROM. *See also* AUTHORIZING SOFTWARE.

electronic mail (e-mail) the transmission of messages by computer from one person to another. Messages are saved until the recipient chooses to read them. E-mail is much more convenient than ordinary mail or telephone calls because it arrives immediately but does not require the recipient to be present, nor does it interrupt anything else the recipient may be doing. Messages are easily printed out, saved on

electronic publishing

152

disk, or forwarded to other people.

In e-mail messages, the symbols :) or -) (smiling face or tongue in cheek) denote remarks that are not to be taken seriously; this is important because the recipient cannot hear the sender's tone of voice. (See EMOTICON.) Ill-considered angry messages are fairly common and are called *flames*.

All users of e-mail should be aware that backup copies of the messages can be saved on disk or tape and that perfect privacy cannot be guaranteed.

For abbreviations commonly used in electronic mail, see AFAIK; AFAIR; BTW; FWIW; IANAL; IMHO; IRL; RYFM; TIA; YMMV.

See also ELECTRONIC DATA INTERCHANGE; LOCAL-AREA NETWORK; WIDE-AREA NETWORK.

electronic publishing

1. the creation, manufacturing, and distribution of paperless documents. Examples of electronic documents are CD-ROM encyclopedias and the HOME PAGES on the WORLD WIDE WEB. Each of these new formats brings new challenges and technical problems, but all need the skill of someone who knows how to work with type and how to produce a pleasing combination of graphics and text.

2. the use of specialized computer-controlled equipment in the publishing and printing industries. Desktop publishing may be considered part of this trend, but electronic publishing encompasses the use of equipment not readily available to the mass market (powerful workstation class computers and DIGITAL PRESSES, for example). Electronic publishing is superseding traditional methods of PREPRESS production.

electrostatic printer a printer that operates by using an electric charge to deposit toner on paper. Laser printers are electrostatic printers.

element one of the items in an array or list.

elephant's ear (*slang*) the symbol @; see AT SIGN.

elevator bar a scroll bar; a part of a window frame that provides a convenient way of moving vertically or horizontally through a document or drawing that is too big to display all at once. The position of the *elevator box* (THUMB) gives you a graphical representation of where you are in the document. If the elevator box is near the top of the bar, you are near the top of the document, and likewise for bottom, left, and right. You can DRAG the thumb with the mouse for fast scrolling or you can CLICK on the arrows at the ends of the bar to scroll line by line. Unlike real elevators, elevator bars can be either vertical or horizontal.

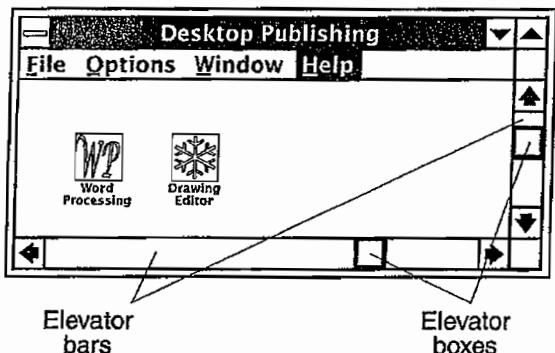


FIGURE 84. ELEVATOR BARS

elite a typewriter typeface that prints 12 characters per inch. *See PITCH; PICA.* The nearest computer equivalent to elite typewriter type is 10-point (12-pitch) Courier.

ELIZA a computer program developed by Joseph Weizenbaum of M.I.T. in 1966 to demonstrate that it is easy to make computers *seem* intelligent. ELIZA carries on a conversation with the user in the style of a psychotherapist, but it actually responds only to certain patterns of words in the input, ignoring the rest. For example, if the user mentions "mother," ELIZA might reply, "Tell me more about your mother."

ELIZA passes the TURING TEST in a crude way, thereby demonstrating that human-like intelligence is easily faked. *See also ARTIFICIAL INTELLIGENCE.*

ellipsis typographic convention of using three dots (...) to indicate the trailing off of a thought. In Windows 3.1 and up, the ellipsis is typed by holding down Alt while keying 133 on the numeric keypad. Macintosh users can type an ellipsis by holding down Option and typing : (colon). Note that the three dots are actually one character. The spacing is different than simply typing three consecutive periods. (Ellipsis ...; Three periods ...)

The ellipsis also has an important function in the menu system of Microsoft Windows (3.1 and up). The appearance of '...' after a menu item means that a dialog box will appear when that command is selected.

e-mail (*noun*) electronic mail; (*verb*) to send a message or file by electronic mail. *See ELECTRONIC MAIL.*

Usage note: The spelling *e-mail*, with the hyphen, is now widely preferred. The older spelling is *email*. Either way, the noun and verb are spelled alike.

271

local variable

load to transfer information from a disk or other outside device into the memory of a computer. *Contrast* SAVE. *See also* LOADER.

loader a computer program whose function is to load another program into memory and transfer control to it. All operating systems include loaders. For example, if you have a program named **myfile.exe** and you type the DOS command

C:\> myfile

you are telling the DOS loader to find **myfile.exe** and load it.

local-area network a network that connects several computers that are located nearby (in the same room or building), allowing them to share files and devices such as printers. For examples, see ETHERNET; TOKEN RING. *Contrast* WIDE-AREA NETWORK.

A local-area network can be very valuable if several people must constantly enter data into a single database. Some database programs, such as Paradox, have network versions designed specifically for this purpose. For example, several workers might work on the same inventory-control system, one of them logging new merchandise as it comes in, the other logging sales as they take place.

For an example of a popular local-area network system, *see* NOVELL NETWARE.

local bus a separate bus in a computer, designed to provide extra-fast access to the CPU for specific devices, such as video cards. It contrasts with the main bus, which connects to most other parts of the computer. For examples *see* VESA LOCAL BUS, PCI.

localization the process of adapting software to run in a particular part of the world. Localization might involve translating screen displays into French or German, adapting to a foreign-language keyboard, printing the date differently (e.g., 1999 Dec 31 in Japan vs. 31 Dec 1999 in Britain and Dec. 31, 1999 in the United States), setting the clock for daylight saving time on different dates, or even writing numbers differently (3,000.95 vs. 3 000.95 or even 3.000,95).

local variable a variable that has meaning only within a particular function or subroutine. The name of a local variable can be used in another subroutine elsewhere in the program, where it will refer to an entirely different variable. Local variables contrast with *global variables*, which are recognized throughout the program.

The advantage of using local variables is not obvious in short programs. However, it is a good idea when writing a long program to make as many variables as possible local, because then there will be no problem if you wish to use the same name to mean something else elsewhere in the program. This rule is even more important if several different people are writing subroutines that will be combined into one main program. *See also* SIDE EFFECT.

polygon

362

polygon a closed geometric figure with any number of straight sides. Triangles, squares, pentagons (five-sided), hexagons (six-sided), heptagons (seven-sided), and octagons (eight-sided) are all examples of polygons.

polymorphism the use of different procedures, each with the same name, which are associated with different object types. For example, procedures named **draw** could be associated with the types **point**, **circle**, and **square**. Calling **draw** for any particular object then activates the right drawing procedure for that type. *See OBJECT-ORIENTED PROGRAMMING.*

Ponzi scheme *see PYRAMID SCHEME.*

pop to remove the topmost item from a stack. *See STACK.*

POP

1. Post Office Protocol, a standard protocol for delivering e-mail to personal computers.
2. point of purchase (point of sale). For example, a POP computer is a computer used as a cash register. *See POINT-OF-SALE SYSTEM.*
3. point of presence, a place where an INTERNET SERVICE PROVIDER can be accessed, such as a local telephone number.

pop-up menu *see PULL-DOWN MENU.*

pop-up utility *see MEMORY-RESIDENT PROGRAM.*

port

1. to adapt a program from one kind of computer to another. For example, some IBM PC programs have been ported to the Macintosh.
2. a connection where a computer can be connected to an external device, such as a modem, printer, or tape drive. *See SERIAL; PARALLEL; SCSI.*
3. a unique number used by a microprocessor to identify an input-output device. For example, the hexadecimal number 3F8 is the port address for part of the circuitry that controls the first serial port (COM1) on the IBM PC.
4. a number identifying the type of connection requested by a remote computer on the Internet. *See URL.*

portable

1. able to be carried around. A portable computer is larger than a laptop computer, but still easily movable.
2. (said of programs) able to run on more than one type of computer.

Portable Digital Document a file format supported by Macintosh computers with QuickDraw GX. A document saved in this format can be viewed on any other Mac with QuickDraw GX, even if the two

420

is jump into
the original
loving toward

pe region and
of one type of
e. A semicon-
i N regions on
g many minia-

s, a command
ther objects or
ID WINDOWS;
NE.



O BACK

a command that
objects. *Contrast*

421

server

sequential-access device a data-storage device in which it is necessary to read through all preceding records before the computer finds the record it is looking for. Tape storage devices are examples of sequential-access devices. *Contrast RANDOM-ACCESS DEVICE.*

serial method of transmitting data one bit at a time over a single wire. Serial transmission is the normal way of linking computers to modems and is often used to link microcomputers to printers, especially relatively slow ones. *See BAUD; RS-232. Contrast PARALLEL.*

serial-access device *see* **SEQUENTIAL-ACCESS DEVICE.**

serial bus a system for rapid communication among components of a computer using a minimum number of wires. Successive bits of each byte or word travel along the same wire, rather than along separate wires as in a conventional bus. *See BUS.* For examples, *see* **FIREWIRE; USB.**

serial mouse a mouse that is attached to a serial port of a computer. *See MOUSE.*

serial port a connection by which a computer can transmit data to another device using serial transmission—that is, one bit at a time. It is usual for a microcomputer to have a serial port that is connected to a modem or printer. IBM PC-compatible computers typically have two serial ports labeled COM1 and COM2; UNIX systems often identify their serial ports as `/dev/ttya` and `/dev/ttyb`. Most serial ports follow the EIA-232D (RS-232) standard. *See RS-232. Contrast PARALLEL PORT.*

serial printer a printer that connects to a computer's serial port. *See SERIAL PORT; PARALLEL PORT.*

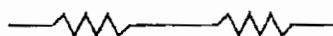


FIGURE 233. SERIES CIRCUIT (TWO RESISTORS)

series connection of two electronic components so that current flows through one and then the other (*see* Fig. 233). *Contrast PARALLEL.*

serif the short finishing strokes of the letterforms in a roman typeface, present in I F A and absent in I F A (Fig. 234). It is thought that the horizontal nature of serifs helps guide the reader's eye along the line of type. *Contrast SANS-SERIF. See also TYPEFACE.*

server a computer that provides services to another computer (called the *client*). On multitasking machines, a process that provides services

service bureau

422



FIGURE 234. SERIF (ON A LETTER)

to another process is sometimes called a server. For specific examples, *see* FILE SERVER; X SERVER; DDE; WEB SERVER.

service bureau a business that provides services to computer users, such as high-quality color printing, disk format conversions, or the like.

service provider a company that provides computer or networking services to customers. *See also* ACCESS PROVIDER; INTERNET.

servlet a Java program that runs on a web server. By contrast, an applet is a Java program running on a web browser client. Servlets provide some advantages over writing CGI scripts for the server: 1) a developer writing the applet in Java can use the same language for the server side of the process; 2) the servlet can run as a thread, not requiring a new CGI process to be restarted with each client request; and 3) the servlet runs in a SANDBOX where it is prevented from doing damage to the server system.

session

1. a period of time during which a person is using a particular computer service, such as a connection to the Internet.

2. an occasion upon which data is written to a recordable CD-ROM. Multisession CDs have had data written to them more than once.

set

1. the input of a flip-flop that places it into state 1, as opposed to the *reset* input. *See* FLIP-FLOP.

2. the command, in DOS, OS/2, Windows, and UNIX, that stores information in the operating system's environment area (*see* ENVIRONMENT). In other operating systems (e.g., VM/CMS and VAX/VMS), the SET command allows the user to customize many aspects of the operating system.

3. in mathematics, a collection of objects of any kind. For example, {2, 4, -425} is a set of numbers, and {{2, 3}, {4, 5}} is a set of sets. *See* SET DIFFERENCE, UNION, INTERSECTION.

4. a data type in Pascal that consists of a group of values of a specified type. For example, a set can be declared with the statement

`VAR smallnums: SET OF INTEGER;`

443

store

startup disk any disk (either a hard drive or diskette) that contains enough of the computer's OPERATING SYSTEM for the disk to be used to BOOT the computer in an emergency. In DOS, a startup disk is created by formatting with the /s option. A Windows 95 or Windows 98 startup disk can be created at the time the operating system is installed, or it can be created by clicking on buttons in this sequence: Start; Settings; Control Panel; double-click on Add/Remove Programs; Startup Disk.

startup folder a FOLDER under the Windows 95 and 98 Start menu containing programs that are to be run automatically when Windows starts up. It corresponds to the PROGRAM GROUP called Startup under Windows 3.1.

statement a single instruction in a computer programming language.

One statement may consist of several operations, such as `LET X = Y+Z/W` (a division, an addition, and an assignment). *See PROGRAMMING LANGUAGE.*

static RAM *see SRAM.*

statistics program a software package for performing statistical calculations.

A statistics program works with lists of numbers instead of single values. It should have built-in commands for calculating the average and standard deviation of the elements of a list, for testing hypotheses about the relationships between variables through methods such as multiple regression, for performing transformations (such as taking the logarithm of each of the elements in a list), and for drawing graphs of the data. Examples of statistics programs include SAS (Statistical Analysis System) and SPSS (Statistical Program for the Social Sciences).

status line a line of information on the computer screen that gives valuable data about the current settings of the software and the current cursor position. The contents of a status line will vary depending on the software used; some programs give different information during the execution of different commands. It is a good idea to get into the habit of noticing what is in the status line. If you do not understand what you see there, take a moment to review the manual.

stochastic random; constantly varying; unpredictable; scattered.

stop bit the bit that indicates the end of an asynchronous RS232 character. (*See RS-232.*) Normal practice is to use two stop bits at 110 baud and one stop bit at higher baud rates.

store

1. to transmit a data item from the computer to a memory device.
2. suffix indicating that an E-MAIL address or WEB SITE is at a store providing goods for sale.

synchronization

1. the act of making a video display scan each line at exactly the right time, so that the image is displayed correctly. The input to a monitor consists of SYNC PULSES as well as red, green, and blue video.

2. the process of keeping two or more disk drives up to date relative to each other, by copying the latest version of each file to each device. This is a practical problem if you work with more than one computer, such as a laptop and a desktop machine. The Briefcase feature of Windows 95 and 98 helps users synchronize files.

synchronous occurring in unison with a separate signal. In synchronous data transmission, there are two signals, *data* and *clock*. The clock signal indicates exactly when the *data* line should be read in order to obtain each successive bit. *Contrast ASYNCHRONOUS.*

sync pulse the part of a video signal that indicates when the electron beam should scan each line. *See SYNCHRONIZATION.*

syntax the set of rules that specify how the symbols of a language can be put together to form meaningful statements. A syntax error is a place in a program where the syntax rules of the programming language were not followed.

synthesizer

1. a device or program for generating speech sounds by computer. *See SPEECH SYNTHESIS.*

2. a device for generating musical sounds by computer, usually from MIDI data. *See MIDI.*

Syquest drive *see EZ DRIVE.*

sysadmin (system administrator) a person who manages a multiuser computer.

sysop (system operator) person who manages a bulletin-board system. *See BBS.*

Sys Req key key on IBM mainframe terminals that enables the user to communicate with the communications system itself rather than the application program. The IBM PC AT and subsequent PCs have a Sys Req key, but little or no software makes use of it.

System 7.5 the 1994 version of the Apple Macintosh operating system.

New features in System 7.5 included: Apple Guide, a help system that can assist you step-by-step through new procedures; the Apple menu may now contain submenus; electronic sticky notes can be stuck to the Desktop; windows may be rolled up to just their title bars to save space (WindowShade); the PC Exchange control panel (which allows the Mac to read and write to PC disks) has been improved; and QuickTime (multimedia support) has been improved. Most important to desktop publishers, a new internal graphics description language,